

## **RESOLUTION NO. 3053**

### **A RESOLUTION ADOPTING REVISED CHAPTERS 3.6 AND 3.8 OF THE CITY OF BEND STANDARDS AND SPECIFICATIONS**

#### **FINDINGS**

- A. The City Council adopted the City of Bend Public Improvement Procedure Standards and Specifications in 2011.
- B. Bend Code Section 3.10.010 authorizes the Council to amend the Standards and Specifications by resolution.
- C. Staff has recommended that the Council adopt revised Part II Chapter 3 Streets and Temporary Traffic, section 3.6 Other Right of Way Design Elements and the addition of section 3.8 Pavement Restoration Requirements of the City of Bend Public Improvement Procedure Standards and Specifications. The amendments will provide additional assurances that street improvements will be designed and built to current standards.

Based on these findings, the City of Bend resolves as follows:

The City of Bend Public Improvement Procedure Standards and Specifications is amended by amending Part II Chapter 3 Streets and Temporary Traffic section 3.6 Other Right of Way Design Elements to read as shown in the attached Exhibit A and by adding Section 3.8 Pavement Restoration Standards to read as shown in the attached Exhibit B.


Adopted by Roll Call Vote the 16<sup>th</sup> day of November, 2016.

YES: Jim Clinton, Mayor  
Victor Chudowsky  
Sally Russell  
Nathan Boddie  
Barb Campbell

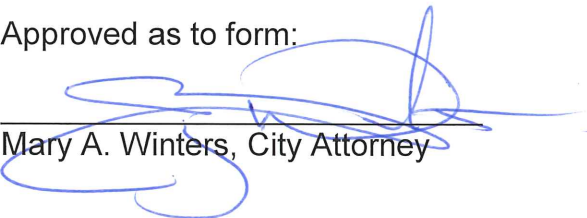
NO: NONE

  
\_\_\_\_\_  
Jim Clinton, Mayor

Attest:

  
\_\_\_\_\_  
Robyn Christie, City Recorder

Approved as to form:

  
\_\_\_\_\_  
Mary A. Winters, City Attorney

## EXHIBIT A

### 3.6 Other Right of Way Design Elements

#### 3.6.1 Sidewalk

The City of Bend in association with the transition plan for City of Bend Americans with Disabilities Act (ADA) Transition Plan for Curb Ramps and Sidewalks in the Public Rights-of-way August 2013 and the 2016 – 2018 ADA Transition Plan for Curb Ramps in Public Rights-of-Way update. The City has developed the following design guidelines and policy in association with the United States Code of Federal Regulations (CFR) (See 28 CFR 35). The 2010 ADA Accessibility Standards are guidelines for helping meet Federal ADA requirements set forth in PROWAG. Curb ramps are required for both new construction and most reconstruction projects. Additionally, maintenance operations or approved privately funded (public) improvements may require upgrades, roadway surface alterations or addition of ADA facilities.

Sidewalk construction and location details shall be as shown on the Standard Details. Asphalt sidewalks are not permitted. Asphalt trails may be used in place of sidewalks as planned in the City's Transportation System Plan. It is not desirable to have two parallel facilities (sidewalk and trail) therefore, when replacing the sidewalk, the trail shall conform and meet all sidewalk requirements as outlined herein.

Sidewalks shall be located within the right-of-way. If design deviations to this location are desired then a request shall be made of the City Engineer. Deviation considerations shall include the review criteria from Chapter 2.2 as well as these specific criteria:

- The centerline of the sidewalk shall not meander more than 35 feet from the street curb line; and
- Where topographical or vegetation limitations require, 15' public access easements (7.5' each side of centerline) shall be provided.
- Sidewalk shall be 5-6 feet in width as required by the Bend Development Code.

##### 3.6.1.1 Obstructions

Structures and obstructions including but not limited to fire hydrants, street signs, utilities, utility poles, signal poles, central delivery mailboxes, and individual mailboxes shall not be located in the accessible path of travel portion of the sidewalk.

##### 3.6.1.2 Horizontal Alignment

Sidewalks shall be constructed abutting the property line (back of walk at 6 inches from property line). Designers may meander the sidewalk from the property line when necessary due to topographical or vegetation issues, rather than economical or other design issues.

The sidewalk shall generally follow a smooth and gradual alignment free of sharp angles or bends; horizontal curves shall not be less than 20' radius.

### 3.6.1.3 Vertical Alignment

Sidewalk grades shall comply with PROWAG guidelines. Changes in vertical elevation of the sidewalk with respect to the roadway's running curb elevation can lead to difficulties in achieving ADA compliance with running slopes and ramp slopes.

The total vertical separation between the top of curb and the top of the sidewalk influences roadside grades and cross-slopes of planter strips.

When curb tight sidewalk is constructed, the total vertical separation between the top of curb and the top of sidewalk shall be zero feet – the sidewalk shall be flush with the curb.

### 3.6.1.4 Surface alterations

A roadway **alteration** includes activities such as reconstruction, rehabilitation, resurfacing, widening, and projects of similar scale and effect (See 2010 ADA Accessibility Standards, section 106.5). Maintenance activities such as filling potholes, minor pavement patching, and limited trench cuts for utilities are not typically considered alterations. However, any of these activities that occur within a street level pedestrian walkway (a marked or unmarked crosswalk) may not reduce the path's accessibility (See 28 CFR 35.133(a)). A street level pedestrian walkway (e.g. marked or unmarked crosswalk) is where the pedestrian would cross an intersecting road, regardless if curb ramps are currently present.

### 3.6.1.5 Sidewalks Through Driveways

Sidewalks shall travel through City Standard driveway aprons at sidewalk grade, with the driveway being segmented by the sidewalk. To maintain their effectiveness, detectable warning surfaces should not typically be used where an accessible route of travel intersects a residential or commercial driveway entrance or within a parking lot. However, the City reserves the right to require detectable warning surfaces at certain high volume commercial entrances that may function like a roadway. The minimum sidewalk width through driveways is 4 feet, zero inches.

## 3.6.2 Curb Ramps and Crosswalks

All required curb ramps must meet the Public Rights-of-Way Accessibility Guidelines (PROWAG) published by the U.S. Access Board. The City, by this reference adopts PROWAG into its standards.

Curb ramps are only required where there is a pedestrian walkway (e.g. a sidewalk or trail/path) with a *prepared surface* that intersects a roadway. *Prepared surfaces* may include concrete, asphalt, or other compacted materials such as soil and granite. Concrete and asphalt are the two most common *prepared surfaces* found in Bend.

Conditions for curb ramp construction:

1. If any work (new construction or reconstruction) impacts a curb where there is a pedestrian walkway (e.g. a sidewalk or trail/path) intersecting a roadway then a new ramp or replacement of an existing non-compliant curb ramp must be constructed.
2. If any work includes resurfacing through a street level pedestrian walkway (e.g. marked or unmarked crosswalk), even if the work is not the full width of the roadway, curb ramps must be built or reconstructed on both ends of the crosswalk.



3. If any sidewalk work connecting to an existing non-compliant ramp that requires any modification to any portion of the ramp to meet current sidewalk design standards, then the entire ramp shall be reconstructed to current standards.
4. If any utility trench work impacts a curb at a cross walk, with or without a ramp, the replacement of an existing non-compliant curb ramp must be constructed.
5. If utility trench work does not impact a curb ramp but is "limited to a portion of the pavement, including a portion of the cross walk" replacement of an existing non-compliant curb ramp may not be required (dependent on overall project scope and required pavement restoration limits).

Any Land Use application for new development that includes requirements for sidewalk construction or frontage improvements meeting current City Standards, all curb ramps along the property frontages shall be reviewed for compliance with current standards. Any non-complaint curb ramps along the property frontage must be brought into compliance. This requirement must be included as a Condition of Approval in the Land Use Decision.

#### **3.6.2.1 Number and Direction of Curb Ramps**

The City prefers each new intersection to be designed with two (paired) curb ramps per corner allowing for all directions of travel, unless site conditions require modification. These are often referred to as **directional** ramps. If site conditions prevent the use of directional ramps, the Design engineer must provide documentation to the City Engineer for review and approval as described in 3.6.2.2.

An example of "all directions of travel" in this case means six curb ramps at a T or three legged intersection. This would be two curb ramps at each corner (one per crosswalk) and two on the "top of the T" allowing for crossing of both roadways.

At a four legged intersection this would be eight curb ramps (two at each corner, one per crosswalk). Each ramp shall run parallel to (in line with) each crosswalk (regardless of if the crossing is marked or unmarked).

#### **3.6.2.2 Type of Ramps Preferred and Documentation**

A perpendicular curb ramp for each crosswalk is the City's most preferred design because it does not present unnecessary grade changes in the path of travel for pedestrians that are not crossing the roadway.

If existing site constraints such as the required use of a "curb tight" sidewalk prevent the use of perpendicular curb ramps, the next most preferred and allowable design options include parallel or combined perpendicular/parallel curb ramps which still provide a separate and distinct curb ramp for each crosswalk. Documentation in writing of existing site constraints preventing the use of a perpendicular curb ramp and instead utilizing parallel or combined perpendicular/parallel curb ramp design must be provided to and approved by the City prior to construction.

A single diagonal curb ramp or blended transition (a blended transition in this case is when the entire sidewalk is depressed at the corner and the resulting landing is shared by two crosswalks) at a corner may only be used when significant existing site constraints do not allow two ramps to be installed (one per crosswalk). Documentation in writing of these significant existing site constraints must be provided to and approved by the City prior to construction.

To summarize the City's requirements for selecting an appropriate curb ramp design, the following flow chart is provided:

- Most preferred: **Perpendicular** curb ramp for each crosswalk (two per corner)
- **Parallel** curb ramp for each crosswalk (two per corner)\*
- **Combined** perpendicular/parallel curb ramp (this provides a separate and distinct curb ramp for each crosswalk)\*
- Least preferred: **Diagonal** curb ramps or blended transitions shared by two crosswalks (only allowed with significant existing site constraints that shall be fully documented, provided in writing to and approved by the City prior to construction)

\*Allowable only if constraints dictate, such as the required use of "curb tight sidewalk". Documentation in writing shall be submitted to and must be approved by the City prior to design and construction.

### 3.6.2.3 Existing Physical Constraints

Where existing physical constraints make it impracticable for altered elements, spaces, or facilities to fully comply with the requirements for new construction, compliance is required to the extent practical within the scope of the project. If the engineer of record deems the work is not practical due to existing constraints, the City Engineer will decide whether any deviation or claim of impracticality is justified. (For more information on existing physical constraints, see below)

A common example of "within the scope of the project" would be when all work related to a project is restricted to one corner of an intersection. In this case the project would only be responsible for providing two accessible curb ramps at this location (regardless of what was present in the existing conditions). The project would not be responsible for constructing new or altering existing curb ramps on the other corners of the intersection outside of the project limits.

Existing physical constraints can include, but are not limited to, underlying terrain and topography, right-of-way availability, underground structures, adjacent developed facilities, drainage, or the presence of a notable natural or historic feature.

### 3.6.2.4 Design Details

Curb ramps must be designed to fit the site and ~~must be~~ detailed on construction plans. The design must provide sufficient horizontal and vertical control and the drawings annotated to ensure that ramp conforms to federal, state, and local accessibility standards. Curb ramps with corresponding grades and transitions must be designed to ensure proper drainage of the intersection. Grades including running slopes and cross slopes must be noted on each quarter delta of the curb return.

To assist in the City's review of plans and for contractors and inspection staff to ensure compliant and quality ramp construction, the following information is required to be shown in plans:

- **Running slope** (parallel to path of travel) percentage and direction
- **Cross slope** (perpendicular to path of travel) percentage and direction



- **Control points** with finished grade and top of curb (where applicable) elevation information\*
- **Dimensions** of features (e.g. length and widths of ramps and landings)

\*Control points may include throats of ramps, top and bottom of ramps and landings, tie-in points to match existing or other proposed features, and any wings or curb returns.

Per PROWAG, the absolute legal maximum constructed slopes allowed are:

- 8.3%\* (or 12:1 run/rise) for a **running slope** (parallel to the direction of travel); and
- 2.0% (or 48:1 run/rise) for **cross slope** (perpendicular to the direction of travel)

Because the City recognizes that when curb ramps are constructed in the field some tolerances from the design may occur, designers are directed to use the following maximum design values to ensure the constructed ramps and sidewalks will be below the following PROWAG required absolute legal maximum slopes:

- For **running slope** (parallel to direction of travel) the maximum design value should be 7.5%\*
- For **cross slope** (perpendicular to direction of travel) the maximum design value should be 1.5%

\*Per PROWAG, if a ramp length of more than 15 feet is needed to achieve the 8.3% maximum **running slope**, then an exception may be permitted. This situation should typically only arise due to topography and terrain constraints and must be documented in writing, submitted to and approved by the City prior to construction.

### 3.6.2.5 Additional Definitions and Requirements

ORS 801.220 defines crosswalks as any portion of a roadway at an intersection or elsewhere that is distinctly indicated for pedestrian crossing by lines or other markings on the surface of the roadway. Where no marked crosswalk exists, a crosswalk is every crossing of an intersection.

In general, when a feature in the public right-of-way is altered, the requirements for new construction must be applied to the maximum extent feasible. Any design that does not meet the accessibility requirements for new construction must be documented in writing, submitted to and approved by the City prior to construction.

Detectable warning surfaces are required on all accessible curb ramps, and where the pedestrian paths of travel cross intersecting roadways, such as a paved trail intersecting a roadway with no curb. PROWAG refers to this as a blended transition. Detectable warning surfaces must extend for the full width of the curb ramp or blended transition.

### 3.6.2.6 Planter Strip

The planter strip is that portion of the roadside that is located between the curb and the sidewalk. Planter strips are required to conform to roadside safety requirements in terms of their slope, landscaping, appurtenances, utilities, etc.

The landscaped portion of the planter strip must be a minimum of 5 feet wide, except where the sidewalk meander returns to be adjacent to the curb. In order to prevent sharp re-entrant angles in the landscaped portion of the planter strip, an edge not less than 8 inches long and squared to the curb must be constructed at the juncture of the sidewalk to the curb.

Planter strips must contain street trees. Street trees shall conform to the City's landscaping requirements found in Chapter 12 and sight distance requirements in Chapter 3.3 of this document. Planter strips may be utilized for on-street parking, wide sidewalks, swales, or landscaping and shall conform to the applicable Bend Development Code provision. When used for landscaping, the landscaping shall conform to the City's xeriscape and landscape provisions found in Chapter 12 of this document.

The cross-slope of the planting strip between the curb and the right-of-way must not be steeper than 4H:1V to provide a recoverable roadside slope. All appurtenances, utilities and structures located within the planter strip that are roadside safety obstacles must comply with roadside safety principles of Chapter 1.6 of this document. Obstacles must be located as far from the roadway as possible and be designed with recoverable slopes or breakaway foundations complying with AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, with interim revisions."

The planter strip must not contain stairs. Stairs are not allowed to be located within the public way. Deviations to this standard may be submitted to the City Engineer for design standard deviation review per the requirements of Chapter 3.2 of this document.

#### **3.6.2.7 Exceptions**

This section identifies exceptions to the ADA requirements. The City's Transition plan outlines requirements for operation of the ADA program. This design guideline does not set direction of maintenance activities or operational goals outlined in the transition plan. However, when a ramp upgrade or installation is required, it must meet these requirements unless otherwise stated in a project scope or contract.

### **3.6.3 Transit Facilities**

Bus stop locations, bus pull-out locations and transit facilities located within the public right-of-way shall be approved by the City Engineer.

When evaluating bus stop locations or a corridor of stops, the impact on roadway operations and safety shall also be considered. Analysis inputs should include: dwell time; bike lane and travel lane blockage effects; transit vehicles ability to enter and exit the flow of traffic; convenience and safety of passengers; and convenience and safety of pedestrians accessing the bus stop.

Transit facilities shall be designed to incorporate roadside safety features by locating benches and shelters far away from the traveled edge of the roadway, as close to the right-of-way line as possible. Deviations in sidewalk alignment to facilitate the installation of transit facilities shall be designed to comply with the horizontal alignment requirements of this chapter. Consideration should be given to using breakaway support features to reduce the crash severity of vehicle run off the road events when elements cannot be located with adequate clearance to the traveled way.

#### **3.6.3.1 Bus Stop Locations**

A Transit or bus stop is a designated place along a transit route typically in the street right-of-way where a public transit vehicle stops to load and unload passengers. The following are design guidelines for the locations of bus stops:

- Distance between stops is typically 800 feet;



- Stops are located in areas where passengers have a safe and direct access to sidewalks, walkways and waiting areas;
- Passengers have access to an accessible route to and from the bus stop and onto the bus;
- Convenient access for pedestrians;
- Analysis and design of safe pedestrian crossings of the roadways are incorporated into bus stop locations;
- A properly developed and located bus stop allows for safe movement by the bus in to and out of the main traffic flow.

### **3.6.3.2 Types of bus stop locations**

#### **3.6.3.2.1 Far-side**

Far-Side bus stop is a stop that is located immediately following an intersection and is recommended when:

- Traffic in the direction the bus is traveling is heavier approaching the intersection than leaving the intersection;
- There is high demand for right turns in the direction the bus is traveling;
- The crossing street is a one-way street where traffic flows from left to right;
- The location is one that offers a clear advantage for transit riders by providing improved access to a major destination or to other intersecting bus routes;
- Priority control at the traffic signal is utilized to maintain bus schedules.

#### **3.6.3.2.2 Near-side**

Near-Side bus stop is a stop that is located immediately before an intersection and is recommended when:

- Traffic in the direction the bus is traveling is heavier leaving the intersection than approaching the intersection;
- The cross street is one-way where traffic flows from the right to left;
- The location is one that offers a clear advantage for transit riders by providing improved access to a major destination or to other intersecting bus routes.

#### **3.6.3.2.3 Mid-block**

Mid-block bus stop is a stop that is generally located 100 feet or more before or beyond an intersection and is recommended when:

- The distance between intersections far exceed the standard for bus stop spacing;
- Traffic or physical street characteristics prevent siting a stop close to an intersection;
- The bus stop serves large businesses, housing developments, or other significant trip generators.

### **3.6.3.3 Bus Stop Turnouts**

Bus stop turnouts are not standard for arterial and collector roadways. Design standard deviations review shall consider the following criteria:

- Bus dwell time;
- Dwell time impact on bicyclists; and
- Width of roadway and impact of following vehicles passing bus during dwell time on arterial or collector roadway operations and safety.

When approved, bus turnouts shall be designed in accordance with the current standards set forth in AASHTO.

### **3.6.4 Driveways**

The locations of new driveways shall be approved through land use (e.g. part of a master plan, subdivision, or site plan) and through a right-of-way permitting process. Driveways shall be reviewed with the following considerations:

- There is a valid land use approval for the driveway (or it is confirmed that no land use approval is necessary for the driveway in question);
- There is only a single access point to the property;
- The access is to the lowest classified roadway facility abutting the property (alleys are lower classifications than local streets);
- Adequate intersection sight distance for all turning movements in and out of the proposed driveway are provided;
- The driveway meets the following minimum spacing (22 feet apart (bottom of curb drop to bottom of curb drop))
- Maximum distance to an intersection is provided given the lot configuration and site layout.
- Driveways shall not compromise safety and operations

Concrete driveway aprons are required on all new construction or reconstruction. New construction or reconstruction of alleys shall have driveway aprons. The driveway apron shall be designed to ensure that all drainage is contained on-site. Design standards deviation requests to consider a curb return rather than a driveway apron may be considered by the City Engineer in accordance with 4.2 and the following specific driveway review criteria:

- The design vehicle for the site is too large to accommodate turns within the standard driveway apron; and
- All site drainage is still contained on-site.

The minimum sidewalk width through driveways is 4 feet, zero inches, for construction within the City of Bend. The design shall provide sufficient horizontal and vertical control and the drawings annotated to ensure that driveway conforms to federal, state, and local accessibility standards.

### **3.6.5 BIKE LANES – Under Construction**

#### **3.6.6 Signing**

No sign shall be designed for or installed within public right-of-way unless it has first been reviewed and approved by the City Engineer or designee.

Street signs and barricades shall be designed and installed according to City of Bend Standards and Specifications, and meet the requirements of the most current edition of the Manual on Uniform Traffic Control Devices (MUTCD) as well as the Oregon Supplements to the MUTCD. This applies to signs and traffic control devices on all streets open to public travel, whether publicly or privately owned or maintained.

To provide appropriate roadside safety, ground-mounted signposts shall be breakaway in compliance with the current AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, with interim revisions."

New signs shall be installed, and existing signs modified, to reflect new lane configurations and in coordination with existing or revised pavement markings. Remove and replace signs beyond the project limits as necessary to reflect changes implemented with the project.

Existing signs within project limits that are not in compliance with these requirements in terms of offsets, siting, physical condition, and applicability shall be updated to bring them into compliance.

Plans shall reference signs by MUTCD type, and include designs for all non-standard signs. Designs for standard signs are provided in FHWA's Standard Highway Signs manual; ODOT's Sign Policy and Guidelines and the City's Standard Details include designs for Oregon- and City-specific sign designs not found in the federal manual.

Before any new highway, detour, or temporary route is opened to traffic, all necessary signs and barricades shall be in place. Signs necessitated by road conditions or restrictions shall be removed when those conditions cease to exist or the restrictions are withdrawn. Temporary TRAFFIC CONTROL CHANGE AHEAD signs, installed on wood posts, shall be installed on any project that changes traffic control type.

##### **3.6.7.1 Placement**

Sign installations shall not block pedestrian paths of travel in the sidewalk; an ADA-compliant pedestrian access route shall be maintained at all times.

For arterial and collector roadways, the signs shall be visible from, at a minimum, the stopping sight distance of the roadway for the design speed (AASHTO). This requires that street name signs not be placed too far around curb returns on side streets to meet the visibility requirements. Existing and proposed site features shall be reviewed to ensure that there are no existing or proposed obstructions to sign visibility within this required sight distance.

Signs for private streets at intersections with public streets (i.e. Stop sign/street name sign installations) shall be installed within public right-of-way.

End-of-Road Markers shall be installed on dead-end or stub streets where the pavement ends. Type III barricades are advisable where a higher level of visual cue is desired, such as where the end of roadway precedes a non-traversable slope or major obstruction.



Type III barricades, with appropriate road closed signage, shall be installed at the end of the traveled way when the pavement continues but travel is restricted beyond a certain point. The barricades shall effectively block traffic. Barricade colors, reflectivity, and design shall conform to the most current edition of the MUTCD with Oregon Supplements.

### **3.6.7.2 Horizontal and Vertical Clearance**

Sign installations shall comply with the most current edition of the MUTCD and City of Bend Standard Details. Vertical and horizontal clearance to the sign face shall be maintained for vehicular and non-motorized traffic.

### **3.6.7.3 Sign Design**

Detailed drawings of standard signs and alphabets are shown in the Federal Highway Administration (FHWA) Standard Highway Signs manual and ODOT Sign Policy and Guidelines, current edition. These guides shall be followed for sign dimensions, colors, messages, letters, numerals, spacing, borders, etc., except as otherwise provided in these City Standards and Specifications.

Drawn-to-scale drawings for nonstandard signs shall be included in the construction plan set for approval prior to fabrication.

Standard post-mounted street name signs are single-sided; signal mast arm-mounted street name signs and central island roundabout street name signs are single-sided.

### **3.6.7.4 Street Name Signs**

Street name signs naming both streets shall be installed at each intersection. The signs shall be mounted with their faces parallel to the streets they name.

In business districts and on collectors and arterials, street name signs shall be placed in at least two locations, on diagonally opposite corners so that they shall be on the far right side of the intersection for traffic on the major street. On local streets and residential areas, street name signs shall be placed in at least one location for each intersection.

Street name signs at signalized intersections shall be mounted overhead on signal pole mast arms for optimal viewing. Such signs shall be included on the Traffic Signal Plans. Maximum sign sizes and placement specifications apply; refer to the Oregon Standard Drawings.

Signs for private streets shall be installed on private property, outside of public right of way. Such sign installations shall incorporate a supplemental PRIVATE DRIVE sign mounted below the standard street name sign.

#### **3.6.7.4.1 Colors and Visibility**

Public street name signs shall have a white border along the outside edge of the sign and white lettering. The colored background shall be green.

Private street name signs mounted on private property at locations other than intersections with public streets shall include a background color of retro-reflective green, blue, brown, or black, with white retro-reflective lettering. Private street name signs shall be accompanied by a supplemental black on yellow PRIVATE DRIVE sign when installed at intersections with public streets.

School-related signs shall be fluorescent yellow-green.



### **3.6.8 Pavement Marking/Striping**

Striping and other pavement markings shall be provided on all arterial and collector streets within City limits. Striping of local streets is not required unless deemed necessary by the City Engineer.

Striping designs shall comply with the current edition of the MUTCD with Oregon Supplements, and City Standards and Specifications. Oregon Standard Drawings TM500-TM503 contain pavement marking line and legend details.

Plans shall show and identify a minimum of 300 feet of existing striping beyond the project limits, to ensure proper tie-in to existing striping. Where project limits occur within 500 feet of existing pavement or striping tapers, limits of striping plans shall be extended to include the full taper. Plans shall show and identify all existing striping and include all striping removal necessary to implement new striping as shown.

Plans shall reflect the following City standards:

- Left turn lane transitions - where painted center medians transition to left turn lanes, gaps are preferred over reverse curves.
- Turn lane storage shall reflect 95<sup>th</sup>-percentile queues as determined in a queuing analysis, which shall be submitted with the striping plan.
- The City does not use raised pavement markers (RPM's) on the roadway surface, due to snow removal operations.
- Leading ends of raised medians and islands shall be painted yellow or white as applicable, in conformance with the MUTCD. Reflective RPM's of the same color shall be placed on the top of the curb around the leading ends of medians and islands. In addition, surface-mounted tubular markers shall be installed as shown in City's Standard Detail for median end treatments.
- Where a fixed obstruction is present within a paved roadway, such as a raised median preceded by a painted median or two-way-left-turn-lane, the approach area shall be marked with Transverse diagonal lines and no passing lines, unless otherwise provided in Section 3 of the MUTCD.
- Marked crosswalks shall be provided at all signalized intersections and at other locations according to the City's Standard Operating Policy. Crosswalks shall not be marked at uncontrolled locations without City Engineer approval..

### **3.6.9 Mailboxes**

Mailboxes located within roadway rights-of-way are subject to these Standards and Specifications. Roadside design safety aspects shall be considered. Fatal crashes have occurred within the City of Bend due to vehicles striking mailbox fixed object hazards that did not provide breakaway supports. Foundations and support structures of individual and cluster postal delivery boxes shall meet the current AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, with interim revisions."

The mailbox shall be firmly secured to the post to ensure that the impact of a vehicle does not loosen the box which could then become a flying object hazard.

Mailboxes shall not require that users cross an arterial or collector roadway. Mailboxes shall be located on the users side of arterial and collector roadways.

For all new and reconstructed roadway projects, rural delivery mailbox styles shall be considered for consolidation into cluster postal delivery boxes.

The location of cluster postal delivery boxes shall be shown on the engineered plan submittal drawings for review and approval.

Cluster postal delivery boxes shall not be located on arterial and collector streets. Their location shall be shifted to nearby and convenient local streets. When locating the cluster postal delivery box care should be taken to locate it in an area that minimizes impact on abutting properties.

An accessible pedestrian path of travel must be designed and constructed to the mailbox.

An accessible pedestrian path of travel must be maintained on sidewalks adjacent to cluster boxes.

Cluster postal delivery boxes may be constructed on arterial and collector street rights-of-way through a design standards deviation process reviewed for the following criteria:

- A parking bay is provided;
- The center of the parking bay is located in the center of a tangent section of the collector. This tangent section shall have a length of not less than two times the stopping sight distance for the design speed;
- The required right-of-way width shall be increased to provide for the parking bay and necessary accessible path of travel from the assigned mailbox user properties;
- The parking bay shall not be located less than the design stopping sight distance from any intersection;
- The length of the turnout bay shall accommodate two vehicles and shall be not less than 7 feet in depth;
- Curb tapers in and out of the parking bay shall be created with two consecutive reversing curves of 20' radius.
- There shall be adequate stopping sight distance on either end of the turnouts into the parking bay;

The back edge of the sidewalk shall smoothly meander back from the central delivery mailbox station to provide a 5-foot wide unobstructed pathway. The edge of the mailbox shall comply with the City's Clear Zone Requirements of this document.

### **3.6.10 Illumination**

Streetlights are required at all street intersections with collectors and arterials, including private street intersections with collectors and arterials. This requirement does not extend to alley intersections. Requests for street lights at other locations shall be reviewed in conformance with the Transportation Division's Standard Operating Procedure and installed only with City Engineer approval.

Separate street lighting plans are not required for most projects although proposed streetlights shall be shown on plan and profile or utility sheets. Plans must include the following:

- Proposed pole locations shall comply with the City's Roadside Safety requirements of this document.
- Power supply shall be provided via underground wiring and conduit systems conforming to power company requirements.
- Fixtures shall be cut-off fixtures to minimize light pollution and up-lighting.
- Light poles and fixtures shall be approved and maintained by the power company.

On private development projects, all costs of installation shall be borne by the developer. The City will pay for ongoing power and maintenance expenses for public street lighting. Ongoing expenses for private street lighting (including power costs) shall be borne by the developer or homeowner's association.

Decorative lighting will not be permitted without special approval and maintenance agreements signed by the City Engineer.

The City encourages the use of energy-conserving luminaire fixtures. Proposed equipment must be approved by the City Engineer and the power company.

### **3.6.11 Drainage**

Roadways shall comply with the storm drainage requirements of Chapter 6 of this document.

The standard drainage inlet feature for arterials and collectors shall be curb inlet when bike lanes are present.

### **3.6.12 On-Street Parking**

On-street parking shall be designed to accommodate parking parallel to the curb. There may be instances when head in or back in angle parking is desirable. The City will consider these instances on a case-by-case basis.

### **3.6.13 Traffic Calming Devices**

Traffic Calming Devices in the context of the standards means specific traffic calming devices designed to restrict travel speeds over or through a specific location. Traffic calming devices include neighborhood traffic circles (which are very specifically not roundabouts), speed humps and raised pedestrian crossings. Within the context of this document, traffic calming devices are not curb extensions, medians, roundabouts, signals, stop signs or cross-walks as these are typical operational or cross-sectional elements of roadway design.

City standards provide for arterial and collector roadway designs that are reflective of their abutting land use zoning and are sensitive to their surrounding context. The installation of traffic calming devices are not allowed on arterial and collector roadways due to their negative impacts on emergency vehicle routing, maintenance issues, and truck circulation issues.

Traffic calming devices are restricted in use to local residential streets or local commercial streets. Requests for traffic calming devices during the land use process may be evaluated for local residential streets. However, their use shall be approved by the City Engineer and shall not be installed without this approval. Consideration shall be given to emergency vehicle routing.



Currently the City allows traffic circles and raised speed tables or raised pedestrian crossings as traffic calming devices on local streets. Their designs shall conform to the standard drawing for these elements.



## EXHIBIT B

### 3.8 PAVEMENT RESTORATION REQUIREMENTS

**3.8.1.** The City of Bend establishes a "Grade" based pavement cut standards system developed on the date of construction, the last qualifying pavement treatment applied and the Pavement Condition Index (PCI) rating of a pavement. These standards will be in effect for any City roadway from initial construction or from the time the most recent qualifying pavement treatment was applied. The PCI and road classification (Arterial, Collector or Local road) will determine which Grade must be used.

**3.8.2.** Grade 1 - Pavement Cut Restriction Standard (PCI 100-60, < 5 years): Pavement cuts will only be allowed on an emergency basis or through the exception process defined in section 3.8.6. No planned or permitted cuts will be allowed when these standards apply. If pavement cutting is necessary for emergencies, pavement restoration will be at the direction of the City Engineer and may include a full width restoration.

**3.8.2.1.** Grade 2 – Full Standard (PCI 100-60, > 5 years): Pavement cuts must be full depth and extend twelve inches (12") beyond the nominal trench edge longitudinally and transversely (Standard Drawing R-10) and be a minimum of four (4) feet in width. Pavement cuts must be at lane and skip lines. Transverse trenches (perpendicular to the center line) that are less than 20' (inside edge to inside edge) apart shall be patched as one patch. Restoration must extend from curb to fog/bike lane line (5-7' from curb); curb to centerline (if cut is past fog/bike lane line) and curb to curb (if past centerline).

**3.8.2.2.** Grade 3 - Modified Standard (PCI 59-40): Pavement cuts must be full depth and extend twelve inches (12") beyond the nominal trench edge longitudinally and Transversely (Standard Drawing R-10) and be a minimum of four (4) feet in width. Pavement cuts must be at lane and skip lines or center of traveled lanes. Transverse trenches (perpendicular to the center line) that are less than 20' (inside edge to inside edge) apart must be patched as one patch.

Restoration must extend from:

- Curb to fog/bike lane line (5-7' from curb);
- Fog/bike lane line to center of traveled lane;
- Center of Traveled lane to center line;
- Fog/bike lane line to centerline; or
- Curb to curb (if past centerline).

All pavement restoration must be shown on the permit plans and approved prior to construction. Half lane improvement are on a case by case basis and as approved.

3.8.2.3. T-Cut Standard (PCI 39-0): Pavement cuts must be full depth and extend twelve inches (12") beyond the nominal trench edge longitudinally and Transversely (Standard Drawing R-10) and be a minimum of four (4) feet in width.

Applicable standards based on Grade (number of years since last qualifying pavement treatment) and City Street Classification is established in the following table:

**TABLE 1- RESTORATION REQUIREMENTS BY CLASSIFICATION AND TIER**

Classification	PCI 100 - 60 < 5 years	PCI 100-60	PCI 60-40	PCI 40 - 0
Local	Grade 1	Grade 2	Grade 3	T - Cut
Collector	Grade 1	Grade 2	Grade 3	Grade 3
Arterial	Grade 1	Grade 2	Grade 2	Grade 3

Grade 1 - Pavement Cut Restriction Standard; Grade 2 - Full Standard; Grade 3 - Modified Standard; T - Cut Standard (ACP Only)

**Note:** Proposals to deviate from the standards described above may be allowed at the discretion of the City Engineer and will require approval in advance by the City Engineer. See exemption process described below. During the permit review process, the City Engineer will determine the applicable standard based on the above table. (See figures 1-9 attached)

### **3.8.3. PERMITS**

3.8.3.1. As part of obtaining a Right-of-Way permit per Bend Code, Chapter 3.40, Permittee must submit a complete application to Community Development Department for review and approval. A Right-of-Way application is available on the City website. The City Engineer will determine the restoration requirements in accordance with these Standards. The Permittee must provide the City Engineer at least twenty-four (24) hours' notice prior to completing final restoration to allow for inspection. The permittee shall notify the City within 48 hours after completion of the work (3.40.025). Warranty period will not begin unless the final inspection has been completed. Permittee is responsible for all work until the permit is closed and the warranty period begins.

3.8.3.2. If the City Engineer determines, in the City Engineer's discretion, that previous violations of these Standards exist, future construction work may be disallowed until the Permittee has fulfilled all obligations. Written notification by the City Engineer will be sent prior to this action.

### **3.8.4. RESPONSIBLE PARTY**

The Permittee shall be responsible for all construction and warranty requirements of these standards even when the work is done by a Permittee-retained contractor.

### **3.8.5. GENERAL REQUIREMENTS**

3.8.5.1. Materials must comply ODOT Standards and specs and as amended by the City of Bend's Standards and Specifications.

- a. All patching materials and construction requirements not addressed in this document must conform to the City's Special Provisions Section 00744.
- b. To the extent Controlled Low Strength Material (CLSM aka CDF) is required for a particular repair, the Permittee must follow ODOT Standard Specification, Section 00442 – Controlled Low Strength Materials.

3.8.5.2. Pavement Sections must meet the pavement design standards in Section 11.4. and, comply with the following standards:

- a. Local roads shall be 4 inches of pavement and a minimum of 6 inches Base rock.
- b. Collectors shall be 6 inches of pavement and a minimum of 8 inches of base rock.
- c. Arterials shall be 8 inches of pavement and a minimum of 10 inches of base rock.

3.8.5.3. Patching: Full, Modified and T-Cut Standards

- a. Longitudinal cuts that extend through multiple grade classifications require discussion with the City Engineer to determine the appropriate patching approach. In principle, each road section will be patched according to the applicable standard and grade in which it is ranked; however, the City retains the right to require a higher level grade at its discretion.
- b. For all full depth asphalt repairs on local roads, the minimum asphalt thickness shall be four (4) inches, or match the existing depth of asphalt, whichever is greater.
- c. Existing base rock disturbed within full depth asphalt repairs must be re-compacted prior to paving. For trench backfill requirements Bend Standard Specs. (see Standard Drawing R-10)



- d. All cold-planed surfaces must be swept and kept clean at all times. All cold-planed materials must be removed and disposed off-site at the cost of the Permittee.
- e. If a new patch adjoins an existing patch, the existing patch will need to be replaced up to 20 feet from the edge of the new patch. This will be on a case by case basis and will be at the discretion of the City Engineer.
- f. If any part of the excavation, patch or damaged area intrudes into an adjacent lane, that lane must also be replaced.
- g. New patches adjacent to any existing patch must be combined into one patch if there is less than 4 feet separation.
- h. When two (2) or more patches on the same project are created within twenty (20) feet of each other (inside edge of trench to inside edge of trench), they must be incorporated into a single patch at the expense of the Permittee. The total number of street cuts should be kept to a minimum. If there are three or more street cuts within a block every effort must be made to combine all three into one patch. It is at the discretion of the City Engineer to determine the final pavement restoration limits of a project.
- i. All restoration shall be shown on approved permit plans; otherwise the grade standards apply in full.
- j. Pavement cuts must be straight and clean and must be either parallel or perpendicular with respect to the travel lane. No jagged, broken or undermined edges will be allowed unless otherwise approved by the City Engineer.
- k. All pavement overcuts shall be sealed using an ODOT approved edge sealing tack material and clean sand blanket. Edge sealing methods must be consistently applied throughout, four (4) to six (6) inches in width.
- l. Contractors must use appropriate release agents and tack when placing multiple lifts of ACP.
- m. The top lift of asphalt for all longitudinal repairs with a length that exceeds thirty (30) feet must be placed using a paving machine with a screed or an asphalt spreader box.
- n. The completed surface of all courses must be of uniform texture; smooth, uniform as to crown and grade and free from defects. The completed surface of the wearing course must not vary more than one-quarter ( $\frac{1}{4}$ ) inch from the lower edge of a twelve (12) foot straightedge placed parallel to the centerline. Tolerance exceptions and corrective measures due to



existing roadway conditions or other reasons must be approved by the City Engineer.

- o. All areas outside of the travel lanes or shoulders that are affected by the work must be restored to their original condition.

3.8.5.4. Traffic Control:

- a. Permittee must use Section 3.7 for all traffic control.

**3.8.6. Pavement Cut Restriction (Exception Process)**

3.8.6.1. After any street has been constructed, reconstructed, paved or overlaid by the City, the pavement surface must not thereafter be cut or opened for a period of 5 years or as directed by the City Engineer or Director of Streets & Operations. It is understood that field conditions or emergencies may warrant an exception to this Policy. However, the exception process in NO WAY obligates the City to allow cutting or opening the Street Cut Restriction Street, and any such decisions are at the City's discretion.

3.8.6.2. A utility desiring to perform work in Street Cut Restriction streets must schedule a meeting with City staff prior to submittal of a permit application. If an exception is granted, the Private Development Engineering Department will make a concerted effort to protect the integrity of the pavement structure, and to ensure a high quality replacement patch or overlay. Additional restoration requirements and extended limits will apply.

3.8.6.3. When granting exceptions to this policy, the Streets Director or City Engineer may impose conditions determined appropriate to insure the rapid and complete restoration of the street and the surface paving.

3.8.6.4. Valve and manhole repairs shall be exempt from the patching requirements of these standards. Valve and manhole patching requirements must be in accordance with City Standards. All warranty and construction requirements must be met. No longitudinal construction joints must be allowed in the wheel path.

3.8.6.5. Maintenance patching or potholing filling operations shall be exempt from the requirements of these standards.

3.8.6.6. Potholing to find utilities shall be exempt from patching requirements of these standards. To be exempt, it is preferred that all potholes are cut with a core/hole saw. If a larger pot hole is required the pavement cuts must be less than two (2) feet square with no joints in the wheel path and must be backfilled with CLSM or other City approved fill from twelve (12) inches above the utility to bottom of asphalt. Core coupons (removed asphalt circle) maybe grouted back into the existing pavement with an approved method and material.

3.8.6.7. City Owned Projects: City projects will be subject to testing and warranty requirements that are established under the applicable public procurement contracts.

3.8.6.8. An exception from the street cut restrictions standards may be granted if the City Engineer determines that impacts to vehicle, bicycle, and/or pedestrian traffic would negate the public benefit of this standard.

3.8.6.9. Exception Request: Permittee may seek an exception of these Standards as follows:

- a. Permittee must submit an exception request to the City Engineer identifying the proposed project, the impact the project will have on the roadway, the timeline for completion and explaining how all alternative solutions including avoidance have been exhausted.
- b. A meeting with the City Engineer to discuss the project may be required and the City may request additional information.
- c. The City Engineer must accept or deny any such request. If a request is accepted, the City Engineer may attach conditions of approval that require additional restoration of the area affected and/or special inspections, the cost of which shall be borne by the Permittee.

### **3.8.7. Permits for Non Street Cut Restriction Streets and Street Cut Restriction Streets with Approved Exception**

3.8.7.1. No excavation or tunneling must be performed under any area within public rights-of-way prior to first obtaining the applicable permit from the City (permits for emergency work may be issued after the fact per this policy).

3.8.7.2. Applications for utility permits must be made on forms provided by the City. The applicant must describe the purpose, location, and size of the anticipated construction project (work), the name of the person/firm performing the actual work, and the name of the person/firm for whom the utility work is being performed. The application must be endorsed by the person/firm for whom the work is being performed or the person's/firm's agent. By signing the application, it is understood that the person/firm performing the utility work will comply with the requirements of this policy and any conditions imposed upon the work.

3.8.7.3. Depending on the impact to traffic, pedestrians, businesses or residents, public notification plans (signs, advertisements, flyers, public service announcement, etc.) may be necessary and submitted as part of the permit application. It is the responsibility of the permit applicant or the duly authorized

representative to coordinate with all affected neighbors. A pedestrian detour route shall be clearly delineated whenever sidewalks are obstructed.

3.8.7.4. Emergency utility or service lateral repair work necessary for the immediate preservation of life or property is acceptable; provided that any person making such emergency repair work they call for emergency locates. Permittee must notify the City Engineer of emergency repairs not later than the next business day. The ROW restoration for such emergency repairs must be in conformance with the criteria stated in this policy. Note, work necessary to locate faulting utilities, conduits or pipes during the emergency situation is considered part of the emergency repairs. Permittee must make every reasonable effort to restore the roadway quickly.

3.8.7.5. When the City Engineer determines that traffic conditions, safety or convenience of the public necessitates ROW utility or service lateral construction and repair be performed as quickly as possible, the City Engineer will require the permittee to provide adequate personnel, equipment, and facilities on a 24-hour basis such that the utility or service lateral work be completed as soon as practicable. This may include, but is not limited to, flaggers, temporary traffic control signs and devices, lighting, etc. The permittee must be responsible for the cost of providing the necessary personnel, equipment, and facilities.

3.8.7.6. If work is being performed within Highway 20 & 97 (including Parkway 3rd St and Greenwood), coordination with Oregon Department of Transportation (ODOT) may be necessary and the applicant must comply with their requirements for all work solely in the ODOT jurisdiction. For any work in that is jointly permitted, the utility/permittee must provide a copy of the ODOT permit to in conjunction with the City's permit application.

### **3.8.8. Special requirements for Concrete Roads**

All concrete road cuts must be pre-approved before beginning work (except in the case of an emergency situation). Concrete roads must require full panel replacement unless approved otherwise by the City Engineer. All concrete joints must require an approved tie bar and dowel retrofit. Depth of concrete replacement must match the existing thickness or as directed by the City. Care must be made not to undermine the existing panels. If the adjacent panels are disturbed or damaged, they also must be replaced at the City Engineer's direction. All joints must be sealed with material approved by the City Engineer. Where concrete roads are overlaid with asphalt, the concrete must be replaced as described above and asphalt portion of the cut must be constructed according to the pavement standard.

### **3.8.9. NEW DEVELOPMENT**



These standards are minimum standards applicable to all cuts made in existing roadways. For new development, additional requirements may apply. Contact the Community Development Department for specific additional requirements.

### **3.8.10. TEMPORARY PAVEMENT RESTORATION**

3.8.10.1. Pavement must be restored with temporary patches before the road is reopened to traffic as defined below. The Permittee must maintain the temporary patch until the patch has been permanently restored. Gravel surfacing is not acceptable as a temporary patch.

3.8.10.2. Immediate Patch: An immediate patch may be used to open the roadway to traffic. Immediate patches may include the use of steel plates with signs or be a minimum of two (2) inches thick cold mix asphalt on two (2) inches thick crushed surfacing. Immediate patches will only be allowed while work is being completed and must be replaced with an interim or permanent patch within seven (7) days after placement. Steel plates must be pinned and ramped with cold mix asphalt. At the direction of the City staff or City Engineer, Steel plates may not be used from November 1st to the end of March 31st. Higher classification roads are on a case by case basis. Steel plates may only be used for less than 5 working days.

3.8.10.3. Interim Patch: When a permanent patch cannot be completed within seven (7) days of an immediate patch, an interim patch must be used to keep the roadway open to traffic. Interim patches must be a minimum of two (2) inches thick ACP on two (2) inches thick crushed surfacing. Interim patches must be replaced with a final patch within thirty (30) days after placement.

3.8.10.4. Material exceptions may be requested in the event that the ACP Plants have shut down for the season or at the discretion of the City Engineer. Material exception forms must be submitted with the final inspection. Permittee is responsible for making final restoration within 30 days of the ACP plants opening for the season or as directed by the City. Permittee must submit photo documentation, and street location of all street cuts with material exceptions 5 days prior to completing the work

### **3.8.11. TESTING & WARRANTY REQUIREMENTS**

3.8.11.1. ACP testing must be in accordance with Bend Standards and Specifications. Patches greater than 40 feet in length and a travel lane in width may require density testing per the Bend Standards and Specifications and ODOT Standards and Specification (current adopted version). The City reserves the right to require density testing on a case by case basis if field observations indicate minimum compactive efforts are not being achieved as required in the Bend Standards and Specification. .

3.8.11.2. Pavement restoration on roadways under all pavement cut standards will have a minimum warranty period of one year. The patch must be repaired if necessary until the warranty has passed.

3.8.11.3. All warranties will become void if the road receives a qualifying pavement treatment within the patching limits. Qualifying pavement treatments include the following but are not limited to: Mill and overlay, removal and replacement, thin lift overlay, large area patches half a block in length, and half a lane in width or full street reconstruction. Slurry seals, chipseals, and fog seals are not considered pavement treatments; they are considered a maintenance treatment.

3.8.11.4. All warranty work requires that a City inspector be on site. The Permittee must be required to coordinate inspection with the City Engineer.

3.8.11.5. The following minimum defects identified by the City Engineer must be covered by warranty (but not limited to):

- a. Sunken pavement patches greater than or equal to one-quarter ( $\frac{1}{4}$ ) inch (measured by a twelve (12) foot straight edge).
- b. Surface raveling or oxidation due to deficiencies with the asphalt material.
- c. Poor workmanship.
- d. Inadequate compaction per Bend Standards and Specifications.

3.8.11.6. Notice of Repairs

- a. If emergency repairs are needed due to safety concerns, the Permittee must immediately make such repairs and give notice to the City Engineer.
- b. For non-emergency repairs on arterial or collector streets, the Permittee has forty-eight (48) hours in which to make such repairs from time of verbal notice by the City Engineer. For residential streets, the Permittee has up to seven (7) days to make such repairs.
- c. The City may undertake the repairs if not completed within the specified timeframes above. The City Engineer must notify Permittee of non-compliance and Permittee must make all identified repairs within two (2) business days of notification of noncompliance. Repairs involving public safety maybe made by the City without notice. Permittee will be assessed all costs associated with the City performed repairs, plus fifteen (15) percent overhead fees.
- d. If repairs are made other than seam sealing to the warranted patch, a new warranty will be implemented for the new patch.

### **3.8.12. No Dig/Trenchless Technology**

To minimize damage to road surfaces and other surface infrastructure, implementation of no dig/trenchless technology is the preferred method for most utility work.



### **3.8.13. Trenchless Technology Plan Requirements**

3.8.13.1. Applicants for work in the ROW planning to use trenchless technology must submit plans prepared by a qualified professional. Any qualified professional, as defined in this policy, experienced in trenchless utility installation may prepare plans for simple work. Typical "simple work" includes borings of 100' or less perpendicular to street alignment and borings of one City block or 400' whichever is less, parallel to road and sidewalk surfaces. For longer distances, the applicant must meet with Department staff to discuss the proposed operations. The City Engineer may require the plan to be prepared by a qualified registered civil engineer, geotechnical engineer or geological engineer licensed in the State of Oregon and require additional studies or information than those required for "simple work". The plans for "simple work", at a minimum, must address/consider the following:

- a. The proposed bore path (bore plan and profile must be provided) should be planned to allow sufficient room from other utilities or structures for workers to perform maintenance or operations on adjacent utilities. There must be a 5' minimum horizontal and 18" vertical separation between the proposed utility and City sewers or as otherwise directed. However, additional separation may be required depending upon depth of new utility installation, environmental factors, and engineering conditions.
- b. The locations of other utilities within or adjacent to the proposed bore path (within 5 feet) must be shown. Include proposed potholing locations.
- c. In preparing the plan, location of other structures such as manhole covers, valve box covers, meter boxes, telephone and cable television boxes, electrical transformers, conduit, or droplines from utility poles, pavement patches, previous locator markers, heating oil tanks, utility vaults, and sewer lateral cleanouts must be considered.
- d. Include pavement restoration details (as needed) according to this policy. This includes repair of borehole entry pits and potholes.

### **3.8.14. Drilling Fluid Handling**

The trenchless technology contractor must contain, handle, and dispose of drilling fluids in accordance industry and Oregon Department of Environmental Quality standards. Excess drilling fluid must be confined in a containment pit at the entry and exit locations until recycled or removed from the site. Precautions must be taken to insure that drilling fluid does not enter roadways, streams, municipal storm or sanitary sewer lines, and/or any other drainage system or body of water. Unintended surfacing of drilling fluid must be contained at the point of discharge and recycled or removed from the site. Drilling fluids that are not recycled and reused must be removed from the site and disposed at an approved disposal site.



Any damage as a result of using Trenchless Technologies is the sole responsibility of the permittee.

### **3.8.15. Settlement/Heaving Monitoring**

Trenchless technologies must be performed in a manner that will minimize the movement of the ground in front of, above, and surrounding the boring operation; and will minimize disturbance of the surface above and in the vicinity of the boring. The applicant must be responsible for the repair to City infrastructure resulting from heave or settlement caused by the use of the trenchless technology. All operations must stop immediately whenever a vertical change in elevation of 1/2 inch or more, or any surface disruption is observed. The permittee must then immediately report the amount of settlement to the Engineering Inspector, Street Department or Utility Department.

### **3.8.16. Trenchless Technology Operations Guidelines**

All construction work must be performed in accordance with City requirements and industry standards. The permittee must ensure that all cleanup and restoration is in compliance with the City requirements for right of way restoration. In some cases determined by the Department, the permittee will televise, in the presence of Department staff, the City stormwater and wastewater components within five feet parallel to boring activity or crossed by the boring activity.

### **3.8.17. Compliance**

3.8.17.1. As part of the notice of noncompliance, the City Engineer will include a notice to comply within five (5) working days or all future permits may be denied until the problems have been corrected. A meeting must be arranged with the City Engineer and a plan of action to prevent future noncompliance must be presented before issuance of any new permits.

3.8.17.2. Noncompliance Activities include:

- a. Failure to obtain a permit.
- b. Failure to maintain temporary patches.
- c. Failure to make permanent repairs.
- d. Failure to make emergency repairs.
- e. Failure to make warranty repairs.
- f. Failure to inform the City of asphalt completion date.
- g. Failure to follow traffic control measures, as required.
- h. Failure to meet specified timeline for any repairs.

